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following a given depth under the surface, which is about three feet, it is evident that the difference in color is due to a modification of the red clay by some action either atmospheric or aqueous. Now, red clay is the natural residual product of the decaying limestone. Red is, also, the color most generally represented in the mud of the caves. Indeed, there is no macroscopic difference between the red cave earth and the clay on the limestone rocks outside. They are due to the same general cause and constitute the same formation. But the upper three feet of the residual clay on the ridges has been converted into a yellow clay. The same effect has been observed and recorded, by numerous writers, in other unglaciated districts, but in this it is perhaps more prominent than in others. The cause appears to have been not the action of the atmosphere, which is incapable of destroying and removing the red oxide of iron, but the solution and removal of a large part of the iron salt, by percolating water containing acids generated by the decay of the vegetable matter contained in and on the soil.

The writer, believing that certain colors are, to some extent, characteristic of the products of certain periods and certain climates, wishes to propound the following questions:

1. If a residual clay were to form, in the absence of vegetation, at the present time in the Ozarks, would it be yellow immediately or would it first pass through a stage of red color?

2. Did the pre-glacial residual material, in certain districts of the upper Mississippi basin, as, for instance, over the Galena and Niagara limestones of northwestern Illinois, have a yellow stratum over the ordinary red, as in the present subsoil of Stone county, Missouri? (The remains of the pre-glacial residua yet seen by the writer in northwestern Illinois indicate only a red subsoil.)

3. Is it not possible, indeed probable, that the red clay in southwest Missouri

represents some ancient period, while the modification of its upper three feet into a yellow clay is peculiarly the result of a more recent period?

The writer does not intend to answer these questions, but in conclusion will state one fact, which bears strongly on the last and may be found to be a key to its solution. In some long-past period the streams in Stone county laid down a flood-plain of of gravelly clay and silt of a prevailingly bright red color. Obviously, the material came from the soil and subsoil clay of the surrounding ridges. During a later period the same streams laid down a flood-plain of a light brown and yellow color. Obviously, the material came from practically the same position as during the earlier period. For an explanation of the strong contrast between the two fluvial formations we must look to the surface portion of the residua on the ridges. If we read the evidence aright it indicates that, subsequent to the formation of the first river deposit, a change of climate converted the previously red surface portion of the residual clay into a yellow clay, before the advent of the period during which the later formation was deposited.

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CURRENT NOTES ON ANTHROPOLOGY.

SOCIAL ORGANIZATION OF THE INCAN GOVERNMENT.

UNDER the title, 'Die sociale Verfassung des Inkareichs' (Dietz, Stuttgart), Dr. Heinrich Cunow, already known by an able treatise on the Australian aborigines, presents an analysis of the government and sociology of the Peruvians before the advent of the Spaniards. It is written from a careful comparison of the best early authorities and in the spirit of modern sociological science. The subject, therefore, is presented in a widely different light from that offered in Prescott's History. The

foundation of the Peruvian government was an agrarian communism derived from the rights of the primitive gentes, very much as was the case not only in other parts of America, but, as the author observes, among the ancient Aryans as well. This explanation he develops in a highly satisfactory manner.

The claim, however, which Mr. Cunow puts forward in his preface, that he is the first to make these facts clear, is, doubtless unwittingly, unjust to a worthy American student, Dr. Gustav Brühl, who in his learned volume, 'Die Culturvölker Alt-Amerikas,' Chap. XVII. (Cincinnati, 1887), traces with entire clearness the Peruvian organization to the same source as does Cunow. It is to be hoped that in a future edition the latter will make proper acknowledgment of this.

THE INTERNATIONAL CONGRESS OF AMERICANISTS.

MR. E. DE OLIVARRIA Y FERRARI has issued at Mexico the 'Cronica del Undesimo Congreso Internacional de Americanistas' (pp. 183), giving a narrative of the proceedings of the Congress, its meetings and excursions (not abstracts of papers). The outlines were reported to SCIENCE at the time by Mr. Halsted. The present volume proves still further how courteous and kindly was the reception accorded to the Congress by the authorities and citizens of Mexico.

That meeting, however, was not a regular, but an extra session. The Congress meets only once in two years, and at the last regular meeting, in Stockholm, 1894, it was agreed to convene next in Holland, probably at the Hague. This is still the intention, and the last number of the 'Internationales Archiv für Ethnographie' contains an announcement to that effect. The precise date will be determined later. The volume of proceedings at Stockholm has not yet been issued. The *Compte-rendus* of the

Congress, now numbering many volumes, the first of which was published in 1875, contain numerous articles of value to the student of the archæology and languages of America.

WORD-COUPLING LANGUAGES.

SOMETIMES a single linguistic procedure serves as a valuable trait by which to group linguistic stocks and measure their relative development. Such is the plan of uniting words one to another, so as to form compounds. This has been studied by several writers, and lately by Dr. H. C. Müller, of Leyden, in a monograph, 'Beiträge zur Lehre der Wortzusammensetzung' (pp. 59). While mainly devoted to the Aryan group, he has the breadth of mind, rare among Aryan specialists, to remember that all tongues are not built on Aryan models, and therefore calls under consideration the Ural-Altaic, Australian, and even, *mirabile dictu*, the American languages, for purposes of comparison. In this particular field the last mentioned offer peculiarly abundant topics of study in their synthetic and incorporative character, to which the author alludes, but perceives that the field is too vast to be surveyed in a few pages.

In some groups of tongues, as the Sinitic, word-coupling cannot be said to exist in the sense of the *dvandva* of the Sanskrit grammarians; under certain restrictions, its presence and development lend flexibility, accuracy and poetic power to a tongue, and thus serves as a criterion of linguistic evolution. This and other suggestive thoughts will be found in the essay.

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SCIENTIFIC NOTES AND NEWS.

MEMBERSHIP OF THE INTERNATIONAL CONGRESS OF APPLIED CHEMISTRY.

AN editorial in the *London Saturday Review*, August 1, 1896, makes the following comment